WHAT IS CLAIMED IS:

1.   An electromagnetic waveform comprising a computer program, the computer program for solving constraints during functional verification of a representation of an electronic design of an integrated circuit (IC), the computer
5   program comprising the following steps when executed by a data processing system:

selecting a first set of block-related constraints, from a first set of constraints, according to a first block;

identifying a first set of non-block-related constraints, from the first set of constraints, not selected for the first set of block-related constraints;
10   conjoining the first set of block-related constraints to produce a first solution generator;

existentially quantifying the first block from the first solution generator to produce a first new constraint;

unioning the first new constraint and the first set of non-block-related constraints
15   to produce a second set of constraints;

selecting a second set of block-related constraints, from the second set of constraints, according to a second block;

conjoining the second set of block-related constraints to produce a second solution generator;
20   solving the second solution generator; and

solving the first solution generator using a second result of solving the second solution generator.

2.   A method for solving constraints, comprising:
25   selecting a first set of block-related constraints, from a first set of constraints, according to a first block;

conjoining the first set of block-related constraints to produce a first solution generator;

existentially quantifying the first block from the first solution generator to produce
30   a first new constraint;

identifying a first set of non-block-related constraints, from the first set of constraints, not selected for the first set of block-related constraints;

unioning the first new constraint and the first set of non-block-related constraints to produce a second set of constraints;

5   selecting a second set of block-related constraints, from the second set of constraints, according to a second block;

conjoining the second set of block-related constraints to produce a second solution generator;

solving the second solution generator; and

10   solving the first solution generator using a second result of solving the second solution generator.

3.   The method of claim 2, further comprising:

defining a partition, including the first block, prior to selecting a first set of

15   block-related constraints.

4.   The method of claim 2, further comprising:

defining a partition, including the second block, dynamically by applying a metric to the second set of constraints.

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5.   The method of claim 2, further comprising:

introducing at least one auxiliary variable, prior to the step of selecting a first set of block-related constraints, in order to reduce a complexity of at least one constraint contained in the first set of constraints.

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6.   The method of claim 2, wherein the first block does not contain state variables.

7.   The method of claim 2, further comprising:

30   successively repeating the steps of existentially quantifying, identifying and unioning on a current set of constraints to produce a next set of constraints, and

selecting and conjoining on the next set of constraints according to a next block, until there is no next block.

8.   The method of claim 2, further comprising:

5   existentially quantifying the second block from the second solution generator to produce a second new constraint; and

successively repeating the steps of identifying and unioning on a current set of constraints to produce a next set of constraints, and selecting, conjoining and existentially quantifying on the next set of constraints according to a next block, until

10   there is no next block.

9.   A computer program product comprising:

a computer usable medium having computer readable code embodied therein for determining a solution to a set of constraints, the computer program product including:

15   computer readable program code devices configured to cause a computer to effect selecting a first set of block-related constraints, from a first set of constraints, according to a first block;

computer readable program code devices configured to cause a computer to effect conjoining the first set of block-related constraints to produce a first solution

20   generator;

computer readable program code devices configured to cause a computer to effect existentially quantifying the first block from the first solution generator to produce a first new constraint;

computer readable program code devices configured to cause a computer to

25   effect identifying a first set of non-block-related constraints, from the first set of constraints, not selected for the first set of block-related constraints;

computer readable program code devices configured to cause a computer to effect unioning the first new constraint and the first set of non-block-related constraints to produce a second set of constraints;

computer readable program code devices configured to cause a computer to effect selecting a second set of block-related constraints, from the second set of constraints, according to a second block;

computer readable program code devices configured to cause a computer to
5   effect conjoining the second set of block-related constraints to produce a second solution generator;

computer readable program code devices configured to cause a computer to effect solving the second solution generator; and

computer readable program code devices configured to cause a computer to
10   effect solving the first solution generator using a second result of solving the second solution generator.

10.   An electromagnetic waveform comprising a computer program, the computer program for determining a solution to a set of constraints, the computer
15   program comprising the following steps when executed by a data processing system:

selecting a first set of block-related constraints, from a first set of constraints, according to a first block;

conjoining the first set of block-related constraints to produce a first solution generator;

20   existentially quantifying the first block from the first solution generator to produce a first new constraint;

identifying a first set of non-block-related constraints, from the first set of constraints, not selected for the first set of block-related constraints;

unioning the first new constraint and the first set of non-block-related constraints
25   to produce a second set of constraints;

selecting a second set of block-related constraints, from the second set of constraints, according to a second block;

conjoining the second set of block-related constraints to produce a second solution generator;

30   solving the second solution generator; and

solving the first solution generator using a second result of solving the second solution generator.

11.   A method for image computation, comprising:

selecting a first set of block-related FSM-related representations, from a first set of FSM-related representations, according to a first block;

conjoining the first set of block-related FSM-related representations to produce a first solution generator;

saving the first solution generator for use in a path determination process;

existentially quantifying the first block from the first solution generator to produce a first new FSM-related representation;

identifying a first set of non-block-related FSM-related representations, from the first set of FSM-related representations, not selected for the first set of block-related FSM-related representations; and

unioning the first new FSM-related representation and the first set of non-block-related FSM-related representations to produce a second set of FSM-related representations.

12.   A computer program product comprising:

a computer usable medium having computer readable code embodied therein for image computation, the computer program product including:

computer readable program code devices configured to cause a computer to effect selecting a first set of block-related FSM-related representations, from a first set of FSM-related representations, according to a first block;

computer readable program code devices configured to cause a computer to effect conjoining the first set of block-related FSM-related representations to produce a first solution generator;

computer readable program code devices configured to cause a computer to effect saving the first solution generator for use in a path determination process;

computer readable program code devices configured to cause a computer to effect existentially quantifying the first block from the first solution generator to produce a first new FSM-related representation;

computer readable program code devices configured to cause a computer to

5 effect identifying a first set of non-block-related FSM-related representations, from the first set of FSM-related representations, not selected for the first set of block-related FSM-related representations; and

computer readable program code devices configured to cause a computer to effect unioning the first new FSM-related representation and the first set of

10 non-block-related FSM-related representations to produce a second set of FSM-related representations.

13. An electromagnetic waveform comprising a computer program, the computer program for image computation, the computer program comprising the

15 following steps when executed by a data processing system:

selecting a first set of block-related FSM-related representations, from a first set of FSM-related representations, according to a first block;

conjoining the first set of block-related FSM-related representations to produce a first solution generator;

20 saving the first solution generator for use in a path determination process;

existentially quantifying the first block from the first solution generator to produce a first new FSM-related representation;

identifying a first set of non-block-related FSM-related representations, from the first set of FSM-related representations, not selected for the first set of block-related

25 FSM-related representations; and

unioning the first new FSM-related representation and the first set of non-block-related FSM-related representations to produce a second set of FSM-related representations.

30 14. A method for finding a path of states through an image computation, comprising:

obtaining a first set of solution generators saved from an image computation process;

applying the first set of solution generators to a first state to determine a second state, of a second set of states at one time-step to a time step of the first state, wherein

5   the first state is reachable from the second state.

15.   The method of claim 14, wherein the first set of solution generators are also applied in order to determine a second combination of primary inputs, wherein the first state is reachable from the second state by applying the primary inputs.

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16.   A computer program product comprising:

a computer usable medium having computer readable code embodied therein for finding a path of states through an image computation, the computer program product including:

15   computer readable program code devices configured to cause a computer to effect obtaining a first set of solution generators saved from an image computation process;

computer readable program code devices configured to cause a computer to effect applying the first set of solution generators to a first state to determine a second

20   state, of a second set of states at one time-step to a time step of the first state, wherein the first state is reachable from the second state.

17.   An electromagnetic waveform comprising a computer program, the computer program for finding a path of states through an image computation, the

25   computer program comprising the following steps when executed by a data processing system:

obtaining a first set of solution generators saved from an image computation process;

applying the first set of solution generators to a first state to determine a second

30   state, of a second set of states at one time-step to a time step of the first state, wherein the first state is reachable from the second state.